

WHAT IS CLAIMED IS:

1. A semiconductor integrated circuit having a surface-emitting laser, comprising:
  - a transparent substrate;
  - the surface-emitting laser composed of a micro tile-like element that is adhered to the transparent substrate;
  - an integrated circuit chip that is flip-chip mounted on the transparent substrate and arranged to cover the surface-emitting laser;
  - and a light receiving device that is included in the integrated circuit chip and is arranged so as to face the surface-emitting laser.
2. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,
  - the light receiving device being a photodiode.
3. The semiconductor integrated circuit having a surface-emitting laser according to Claim 2,
  - the photodiode being an MSM photodiode.
4. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,
  - a light receiving part of the light receiving device being positioned on an optical axis of the surface-emitting laser.
5. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,
  - the integrated circuit chip including an auto power control circuit that controls an amount of light emitted by the surface-emitting laser based on an amount of light detected by the light receiving device.
6. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,
  - the integrated circuit chip including a signal processing circuit and an output signal of the signal processing circuit being an input signal to the surface-emitting laser.
7. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,
  - the transparent substrate including an auto power control circuit that controls an amount of light emitted by the surface-emitting laser based on an amount of light detected by the light receiving device.

8. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,

the transparent substrate including signal processing circuit and an output signal of the signal processing circuit being an input signal to the surface-emitting laser.

9. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,

the transparent substrate including a lens that is positioned on an optical axis of the surface-emitting laser.

10. The semiconductor integrated circuit having a surface-emitting laser according to Claim 9,

the surface-emitting laser being adhered to a surface of the transparent substrate and the lens being provided to a back surface of the transparent substrate.

11. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,

the transparent substrate including a diffraction grating that is positioned on an optical axis of the surface-emitting laser.

12. The semiconductor integrated circuit having a surface-emitting laser according to Claim 11,

the surface-emitting laser being adhered to a surface of the transparent substrate and the diffraction grating being provided to a back surface of the transparent substrate.

13. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,

the light receiving device having wavelength selectivity.

14. The semiconductor integrated circuit having a surface-emitting laser according to Claim 13,

a light receiving part of the light receiving device being provided with a filter that transmits only light of a predetermined wavelength.

15. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,

the surface-emitting laser being adhered to the transparent substrate with adhesive that is transparent.

16. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,

the micro tile-like element including a lower multilayered reflective layer, an active layer that is provided above the lower multilayered reflective layer, and an upper multilayered reflective layer that is provided above the active layer.

17. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,

the micro tile-like element being formed by forming a semiconductor element on a semiconductor substrate and separating only a function layer that is a surface layer of the semiconductor substrate and includes the semiconductor element from the semiconductor substrate.

18. The semiconductor integrated circuit having a surface-emitting laser according to Claim 1,

the micro tile-like element being formed by forming a semiconductor element on a semiconductor substrate, adhering a film to the semiconductor element side of the semiconductor substrate and separating a function layer including the semiconductor element from the semiconductor substrate.

19. Electronic equipment, comprising

the semiconductor integrated circuit according to Claim 1.

20. A method to manufacture a semiconductor integrated circuit, comprising:  
forming a surface-emitting laser composed of a micro tile-like element;  
adhering the surface-emitting laser to one side of a transparent substrate;  
flip-chip mounting an integrated circuit chip having at least a light receiving device on one side of the transparent substrate;  
providing the integrated circuit chip so as to cover the surface-emitting laser;  
and arranging the integrated circuit chip and the light receiving device so as to make a light emitting surface of the surface-emitting laser face a light receiving surface of the light receiving device.

21. The method to manufacture a semiconductor integrated circuit according to Claim 20, further comprising:

providing an auto power control circuit that controls an amount of light emitted by the surface-emitting laser based on an amount of light detected by the light receiving device before flip-chip mounting the integrated circuit chip.

22. The method to manufacture a semiconductor integrated circuit according to Claim 20, further comprising:

providing one of a lens and a diffraction grating at a position where an optical axis of the surface-emitting laser crosses on the other side of the transparent substrate.